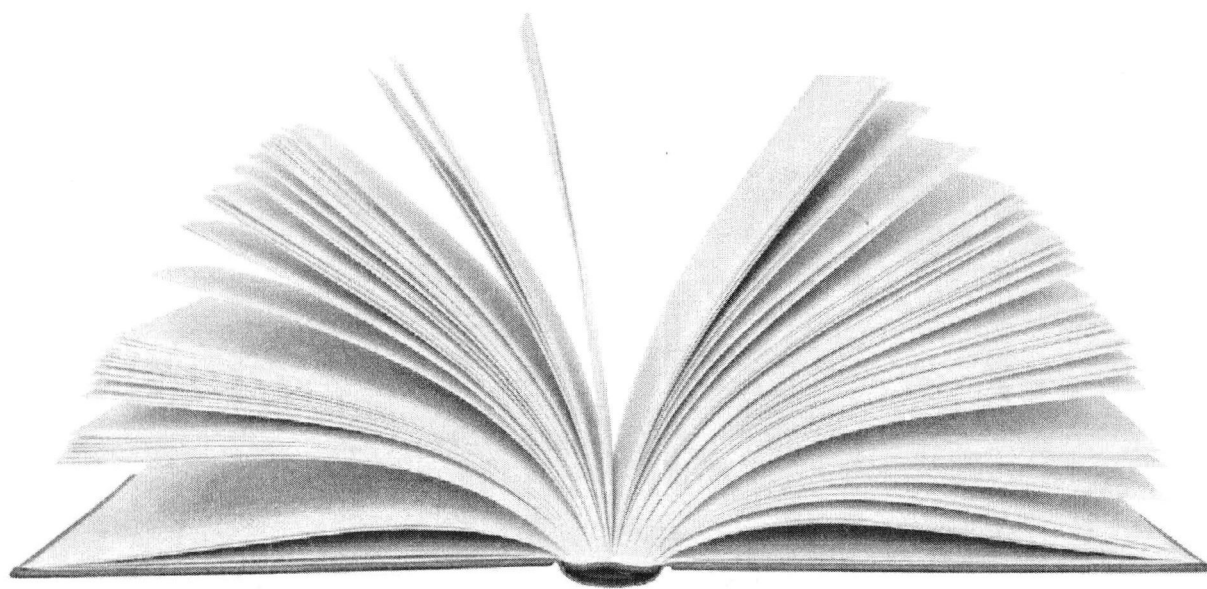


Assessment Highlights
Grade 6 Science
2007
and
A Released Achievement Test



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This document contains both an Assessment Highlights report on the 2007 Grade 6 Science Achievement Test and a release of the 2006 Grade 6 Science Achievement Test.

The Assessment Highlights report provides information about the overall test, the test blueprint, and student performance on the 2007 Grade 6 Science Achievement Test. Also provided is commentary on areas of strength and weakness in student performance at the *acceptable standard* and the *standard of excellence* on selected items (common to both the 2007 and 2006 achievement tests). This information is intended for teachers and is best used in conjunction with the multi-year and detailed school reports that are available to schools via the extranet. Beginning in 2007, **Assessment Highlights reports** for all achievement test subjects and grades (except Grades 3, 6, and 9 Français/French Language Arts, and Grade 9 Knowledge and Employability courses) will be **mailed** to school administrators **every year** in the fall.

The released items include 49 multiple-choice questions from the 2006 Grade 6 Science Achievement Test. These released items are available only in print form because of copyright limitations. Also included are a test blueprint and an answer key that includes the difficulty, reporting category, topic, and item description for each test item. These materials, along with the Program of Studies and Subject Bulletin, provide information that can be used to inform instructional practice.

Released items from previously secured tests have been made available to teachers in print form. Print versions of released items, which contained approximately 25% of the total number of test items from previously secured tests, were mailed to school administrators each fall from 2004 to 2006.

Every second year, beginning in the fall of 2007, **a complete test** for all achievement test subjects and grades (except Grades 6 and 9 Social Studies; Grades 3, 6, and 9 Français/French Language Arts; and Grade 9 Knowledge and Employability courses) will be **mailed** to school administrators as an attachment to the Assessment Highlights report for that year. In this way, teachers will receive complete forms of achievement tests.

For further information, contact Darrell Paquette, Grades 6 and 9 Science Examination Manager, at Darrell.Paquette@gov.ab.ca, Ian Drysdale, Grades 6 and 9 Science Examiner, at Ian.Drysdale@gov.ab.ca, or Jo-Anne Hug, Director, Achievement Testing, at Jo-Anne.Hug@gov.ab.ca at Learner Assessment, or call (780) 427-0010. To call toll-free from outside Edmonton, dial 310-0000.

The Alberta Education Internet address is www.education.gov.ab.ca.

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The 2007 Grade 6 Science Achievement Test

This report provides teachers, school administrators, and the public with an overview of the performance of those students who wrote the 2007 Grade 6 Science Achievement Test. It complements the detailed school and jurisdiction reports.

How Many Students Wrote the Test?

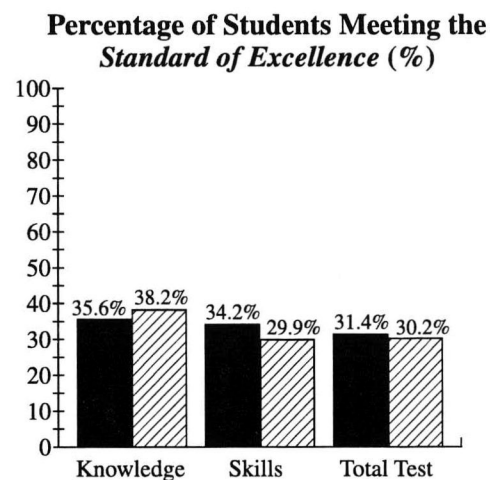
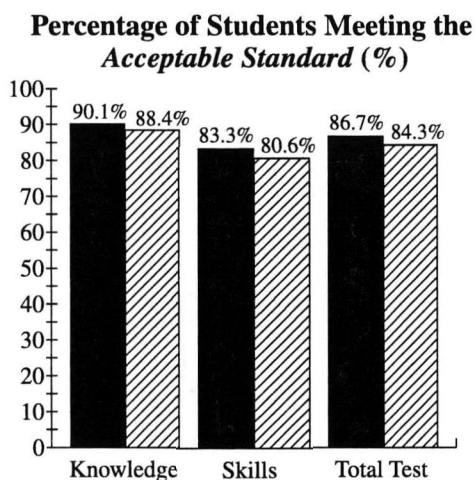
A total of 37 237 students wrote the 2007 Grade 6 Science Achievement Test.

What Was the Test Like?

The 2007 Grade 6 Science Achievement Test consisted of 50 multiple-choice questions based on five science topics: Inquiry and Problem Solving; Air, Aerodynamics, and Flight; Sky Science; Evidence and Investigation; and Trees and Forests.

How Well Did Students Do?

The percentages of students meeting the *acceptable standard* and the *standard of excellence* in 2007 compared with 2006 are shown in the graphs below. Out of a total possible score of 50, the provincial average was 33.5 (67.0%). The results presented in this report are based on scores achieved by all students who wrote the test except those in French Immersion and Francophone programs (results for these students are reported separately). Detailed provincial assessment results are provided in school and jurisdiction reports.



■ 2006 Achievement Standards: The percentage of students in the province who met the *acceptable standard* and the *standard of excellence* on the 2006 Grade 6 Science Achievement Test (based on those who wrote).

▨ 2007 Achievement Standards: The percentage of students in the province who met the *acceptable standard* and the *standard of excellence* on the 2007 Grade 6 Science Achievement Test (based on those who wrote).

2007 Test Blueprint and Student Achievement

In 2007, 84.3% of students who wrote the Grade 6 Science Achievement Test achieved the *acceptable standard*, and 30.2% of students who wrote achieved the *standard of excellence*. These results are slightly lower than those for previous administrations of the achievement test.

Student achievement on the 2007 Grade 6 Science Achievement Test averaged 33.5 out of a total score of 50 (67.0%).

The blueprint below shows the reporting categories and topics by which 2007 summary data are reported to schools and school authorities, and it shows the provincial average of student achievement by both raw score and percentage.

Topics	Reporting Category		Provincial Student Achievement Average (Raw Score and Percentage)
	Knowledge	Skills	
	Fundamental understanding of both the concepts and the processes of science	Application of science processes and the use of higher-level thinking to solve problems	
Inquiry and Problem Solving			7.4/11 (67.3%)
Air, Aerodynamics, and Flight			9.4/14 (67.1%)
Sky Science			5.2/8 (65.0%)
Evidence and Investigation			5.2/7 (74.3%)
Trees and Forests			6.4/10 (64.0%)
Provincial Student Achievement (Average Raw Score and Percentage)	13.7/20 (68.5%)	19.8/30 (66.0%)	Total Test Raw Score = 50

Commentary on 2007 Student Achievement

The following is a brief summary of the areas where most students experienced difficulties and demonstrated strengths on the 2007 Grade 6 Science Achievement Test. Four sample questions are also provided to highlight some of these areas. These questions are no longer secured and will not be reused on future achievement tests.

Students demonstrated relative strength by being able to:

- apply suitable methods to interpret and evaluate experimental observations and measurements
- identify adaptations that enable birds to fly and relate those adaptations to aircraft control surfaces
- describe the apparent movement of constellations in the night sky relative to Earth
- analyze a soil classification table to infer a person's prior location
- determine titles for four sections of a concept map that lists several benefits of trees and forests

For **multiple-choice 14**, a Knowledge question, students had to identify the structure of a bird that functions in the same manner as the rudder of an airplane. Students who understood that long tail feathers function like an airplane rudder were successful in responding to this question. Approximately 77.0% of students who met the *acceptable standard* and 94.9% of students who met the *standard of excellence* answered this question correctly.

- 14.** The part of a bird that works **most** like the rudder of an airplane is the bird's
- A. curved wings
 - B. hollow bones
 - C. long tail feathers
 - D. strong chest muscles

13.8% of students chose A;
3.7% of students chose B;
76.8% of students chose C (correct answer); and
5.6% of students chose D.

For **multiple-choice 36**, a Skills question, students had to analyze information in a chart to identify a fabric that has specific characteristics. This required students to apply suitable methods to interpret and evaluate experimental observations and measurements. Approximately 90.3% of students who met the *acceptable standard* and 98.2% of students who met the *standard of excellence* answered this question correctly.

Use the following information to answer question 36.

A teacher conducted an experiment to determine the characteristics of different fabrics. All the fabric samples had an area of 5 cm².

Characteristics of Fabrics

Fabric Sample	Stretch of Fabric (cm ²)	Colourfastness	Flammability	Absorbency of a 5 mL Water Sample	Weave
1	1	No	Melts	0.5 mL of water is absorbed	Tight
2	2	No	Burns to a residue	0.5 mL of water is absorbed	Loose
3	3	No	Melts	1.0 mL of water is absorbed	Tight
4	3	Yes	Burns to a residue	4.5 mL of water is absorbed	Loose

36. Which fabric sample was not colourfast, not highly water absorbent, and had a loose weave?

- A. 1
- B. 2
- C. 3
- D. 4

2.6% of students chose A;
 87.4% of students chose B (correct answer);
 4.9% of students chose C; and
 4.9% of students chose D.

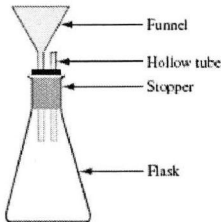
Students experienced relative difficulty with:

- determining the procedures that are necessary to perform a given experiment
- determining the relationship between air and water in an experiment involving water dripping into a flask
- interpreting a diagram showing Earth's rotation in relation to the sun to determine the time of day
- identifying a controlled variable in a given investigation
- comparing data about tree growth from a table to make an inference about the width of tree rings

For **multiple-choice 8**, a Skills question, students had to determine the relationship between air and water in an experiment involving water dripping into a flask. Students first needed to understand that as the water is added to the flask, the air is displaced. Students were then required to choose the graph that illustrates the results of the experiment over time. Approximately 32.6% of students who met the *acceptable standard* and 72.1% of students who met the *standard of excellence* answered this question correctly.

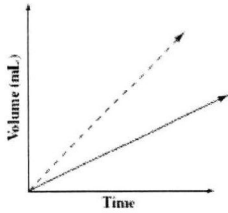
Use the following information to answer question 8.

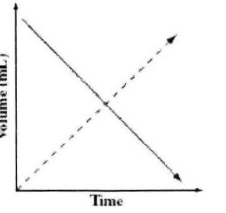
A student sets up a flask as shown below. She continuously fills the flask with water until it is full, while measuring the time that it takes for the flask to fill up.

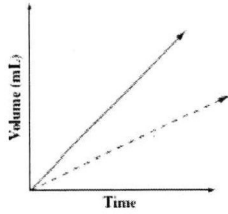


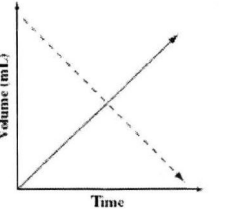
8. Which of the following graphs **best** illustrates the relationship between the volume of air and the volume of water in the flask over the course of the experiment?

Water in flask ——— Air in flask - - - - -

A. 

B. 

C. 

D. 

16.7% of students chose A;
13.8% of students chose B;
26.9% of students chose C; and
42.3% of students chose D (correct answer).

For **multiple-choice 50**, a Skills question, students had to identify a picture of a leaf based on a description of its characteristics. To correctly answer this question, students had to apply knowledge of leaf shapes and leaf arrangements. Approximately 38.3% of students who met the *acceptable standard* and 64.6% of students who met the *standard of excellence* answered this question correctly.

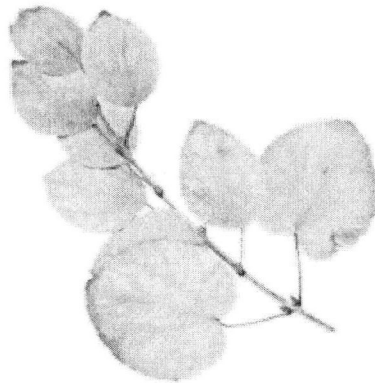
Use the following information to answer question 50.

Characteristics of Leaves on a Branch

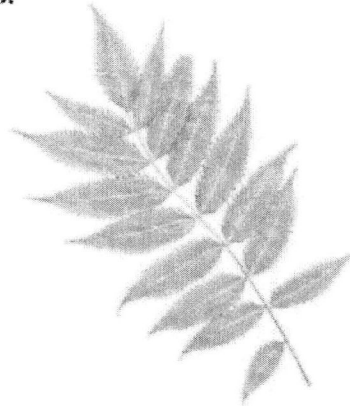
Classification of leaf:	simple
Shape of leaf:	ovate
Pattern on the edge of the leaf:	coarse-toothed
Arrangement of leaves on branch:	alternate

50. Which of the following pictures **best** represents the leaf characteristics described above?

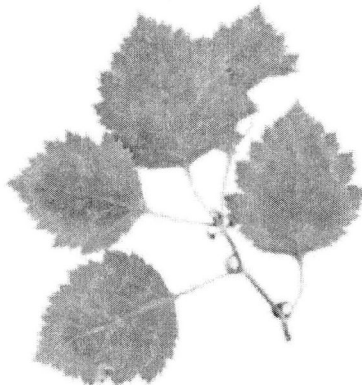
A.



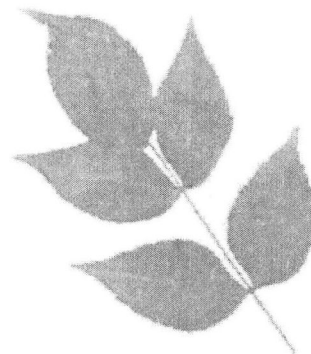
B.



C.



D.



13.1% of students chose A;
16.5% of students chose B;
43.9% of students chose C (correct answer); and
26.4% of students chose D.

Achievement Testing Program Support Documents

The Alberta Education web site contains several documents that provide valuable information about various aspects of the Achievement Testing Program. To access these documents, go to the Alberta Education web site at www.education.gov.ab.ca. On the home page, click on “Kindergarten to Grade 12,” scroll down and click on “Provincial Testing,” and then click on the link for “Achievement Tests.” On the “Achievement Tests” web page, you can access the following documents:

Achievement Testing Program General Information Bulletin

The General Information Bulletin is a compilation of several documents produced by Alberta Education and is intended to provide superintendents, principals, and teachers with easy access to information about all aspects of the achievement testing program. Sections in the bulletin contain information pertaining to schedules and significant dates; security and test rules; test administration and directives; test accommodations; field testing; resources and web documents; calculator and computer policies; test marking and results; samples, forms, and letters; and Learner Assessment contacts.

Subject Bulletins

At the beginning of each school year, Subject Bulletins are posted on the Alberta Education web site for all achievement testing subjects for Grades 3, 6, and 9. Each bulletin provides descriptions of assessment standards, test design and blueprinting, and scoring guides (for Grades 3, 6, and 9 English Language Arts and Français/French Language Arts) as well as suggestions for preparing students to write the tests and information about how teachers can participate in test development activities.

Writing Samples

For achievement tests in Grades 3, 6, and 9 English Language Arts and Français/French Language Arts, writing samples have been designed to be used by teachers and students to enhance students’ writing and to assess this writing relative to the standards inherent in the scoring guides for the *Part A: Writing* achievement tests. The writing samples documents contain sample responses with scoring rationales, student self-assessment checklists, and scoring categories and criteria for the writing assignments.

Previous Achievement Tests and Answer Keys

All January achievement tests (parts A and B) for Grade 9 semestered students are secured and must be returned to Alberta Education. All May/June achievement tests are secured except Part A of Grades 3, 6, and 9 English Language Arts and Français/French Language Arts. Unused or extra copies of only these Part A tests may be kept at the school after administration. Teachers may use the print versions of released items that are mailed to schools in the fall of each year.

Parent Guides

Each school year, print versions of the Parent Guide to Provincial Achievement Testing for Grades 3, 6, and 9 are mailed to schools and posted on the Alberta Education web site. Each guide presents answers to frequently asked questions about the achievement testing program, sample questions for each achievement testing subject, and excerpts from the Curriculum Handbook for Parents identifying what students should know and be able to do in each subject by the end of Grades 3, 6, and 9.

Involvement of Teachers

Teachers of Grades 3, 6, and 9 are encouraged to take part in a variety of activities related to the achievement testing program. These activities include item development, test validation, field testing, and marking. In addition, regional consortia can make arrangements for teacher in-service workshops on topics such as Interpreting Achievement Test Results to Improve Student Learning.

2006 Test Blueprint and Item Descriptions

The following blueprint shows the reporting categories and topics by which questions were classified on the 2006 Grade 6 Science Achievement Test.

Topics	Question Distribution by Reporting Category		Number and Proportion of Questions
	Knowledge	Skills	
	Fundamental understanding of both the concepts and the processes of science	Application of science processes and the use of higher-level thinking to solve problems	
Inquiry and Problem Solving		10, 12, 16, 26, 27, 29, 35, 41, 46, 47, 48	11 Questions (22% of Total Test)
Air, Aerodynamics, and Flight	1, 4, 5, 6, 7, 11, 14, 15, 17	2, 3, 8, 9, 13	14 Questions (28% of Total Test)
Sky Science	18, 20, 22, 23	19, 21, 24, 25	8 Questions (16% of Total Test)
Evidence and Investigation	28, 32	30, 31, 33, 34, 36	7 Questions (14% of Total Test)
Trees and Forests	37, 38, 39, 40, 45	42, 43, 44, 49, 50	10 Questions (20% of Total Test)
Number and Proportion of Questions	20 Questions (40% of Total Test)	30 Questions (60% of Total Test)	Total Test 50 Questions (100%)

The table below provides information about each question on the 2006 test: the keyed response, the difficulty of the item (the percentage of students who answered the question correctly), the reporting category, the topic, and the item description.

Question	Key	Diff. %	Reporting Category	Topic	Item Description
1	D	89.5	Knowledge	Aerodynamics & Flight	Recognize adaptations made to a truck to make it more streamlined
2	A	60.5	Skills	Aerodynamics & Flight	Apply knowledge of the compression of air to determine the best design of an air pump
3	C	63.1	Skills	Aerodynamics & Flight	Apply knowledge of air pressure to identify the movement of air between areas of high and low pressure in an experiment
4	C	48.0	Knowledge	Aerodynamics & Flight	Identify the statement that explains how air pressure is exerted to move a liquid up a straw
5	C	81.1	Knowledge	Aerodynamics & Flight	Identify the structure of a bird that is similar to the rudder of an airplane
6	B	75.7	Knowledge	Aerodynamics & Flight	Identify the statement that explains why penguins cannot fly
7	B	80.7	Knowledge	Aerodynamics & Flight	Apply knowledge of forces involved in flight to make an inference about lift versus gravity
8	B	55.1	Skills	Aerodynamics & Flight	Recognize the correct explanation for experimental results by applying knowledge of Bernoulli's principle
9	D	47.3	Skills	Aerodynamics & Flight	Determine the relationship between air and water in an experiment involving water dripping into a flask
10	C	73.1	Skills	Inquiry & Problem Solving	Identify a control surface on an aircraft that is analogous to a control surface on a sailboat
11	B	53.2	Knowledge	Aerodynamics & Flight	Identify the gas in the atmosphere that allows for combustion
12	D	64.0	Skills	Inquiry & Problem Solving	Identify experimental variables that should be controlled
13	C	65.3	Skills	Aerodynamics & Flight	Identify the function of airplane components
14	B	76.1	Knowledge	Aerodynamics & Flight	Identify the forces involved in flight that are shown on a diagram
15	C	76.0	Knowledge	Aerodynamics & Flight	Identify the procedures that would lead to the controlled roll of an aircraft
16	D	59.1	Skills	Inquiry & Problem Solving	Synthesize data from two graphs to make an inference

Question	Key	Diff. %	Reporting Category	Topic	Item Description
17	A	72.3	Knowledge	Aerodynamics & Flight	Identify the principle that enables a hot-air balloon to fly
18	A	79.1	Knowledge	Sky Science	Recognize celestial bodies that emit light
19	D	49.4	Skills	Sky Science	Infer which graph represents the results of an experiment involving the length of a shadow cast by a metre stick over a day
20	C	83.4	Knowledge	Sky Science	Identify the diagram that depicts the relationship between the sun, Earth, and moon
21	B	33.5	Skills	Sky Science	Identify which diagram represents the phase of the moon approximately seven days after a new moon
22	D	58.6	Knowledge	Sky Science	Determine the month of the year based on the patterned movement of a constellation
23	A	64.6	Knowledge	Sky Science	Recognize the relative size of different components of the universe
24	B	49.5	Skills	Sky Science	Interpret a diagram showing Earth's rotation in relation to the sun to determine the time of day
25	A	67.7	Skills	Sky Science	Interpret a diagram of Earth's rotation in relation to the sun to determine the length of time that has passed
26	A	62.6	Skills	Inquiry & Problem Solving	Analyze a chart to identify a planet with a similar diameter to Earth's
27	D	70.6	Skills	Inquiry & Problem Solving	Synthesize data on a table to infer the relationship between planet diameter and number of satellites
28	A	74.9	Knowledge	Evidence & Investigation	Identify a use for handwriting analysis
29	B	41.8	Skills	Inquiry & Problem Solving	Interpret the information presented in a chart to identify the independent variable in an experiment
30	B	78.4	Skills	Evidence & Investigation	Use a table to identify the type of pen that is used based upon its description
31	D	78.0	Skills	Evidence & Investigation	Use a table to identify the type of pen that is used based upon its description
32	D	84.9	Knowledge	Evidence & Investigation	Identify direction of movement based on tracks depicted in a scene
33	A	80.8	Skills	Evidence & Investigation	Infer the order and direction of tracks depicted in a scene
34	B	75.1	Skills	Evidence & Investigation	Make an inference about the footprints depicted in a map of a crime scene

Question	Key	Diff. %	Reporting Category	Topic	Item Description
35	B	89.1	Skills	Inquiry & Problem Solving	Analyze information in a chart to identify a fabric that has particular characteristics
36	This item is still secured and will not be released at this time.				
37	D	65.7	Knowledge	Trees & Forests	Identify the organism in the food chain based on a description
38	A	77.4	Knowledge	Trees & Forests	Identify shared characteristics of deciduous and coniferous trees
39	D	62.3	Knowledge	Trees & Forests	Identify which of the given species of tree allows for the greatest amount of year-round shade
40	A	74.4	Knowledge	Trees & Forests	Identify a role of forests in producing oxygen and reducing carbon dioxide
41	C	74.9	Skills	Inquiry & Problem Solving	Identify the conclusion that can be drawn from an information table
42	C	45.1	Skills	Trees & Forests	Classify a diagram of branches based on descriptors
43	D	74.0	Skills	Trees & Forests	Classify four species of trees as deciduous and coniferous based on an illustration of their leaves
44	D	80.7	Skills	Trees & Forests	Match a list of characteristics to a species based on information presented in a key
45	C	83.7	Knowledge	Trees & Forests	Recall the role of decomposers in the nutrient cycle
46	C	78.1	Skills	Inquiry & Problem Solving	Synthesize data on a graph to make an inference
47	B	60.7	Skills	Inquiry & Problem Solving	Synthesize data on a graph to make an inference
48	C	74.7	Skills	Inquiry & Problem Solving	Predict the height of a tree at a particular elevation based on experimental observations
49	B	48.5	Skills	Trees & Forests	Compare data about tree growth from a table to make an inference about the width of tree rings
50	C	72.2	Skills	Trees & Forests	Draw a conclusion about tree growth through the analysis of a drawing of a tree cookie

2006 Achievement Test Questions

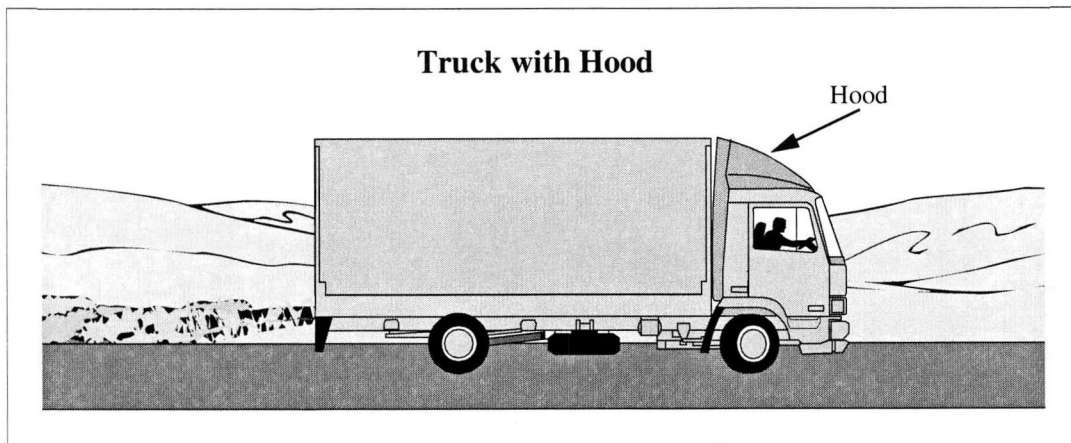
The questions presented in this document are from the previously secured 2006 Grade 6 Science Achievement Test and are representative of the questions that form achievement tests. These questions are released by Alberta Education for teacher and student use.

Grade 6 Achievement Test

2006

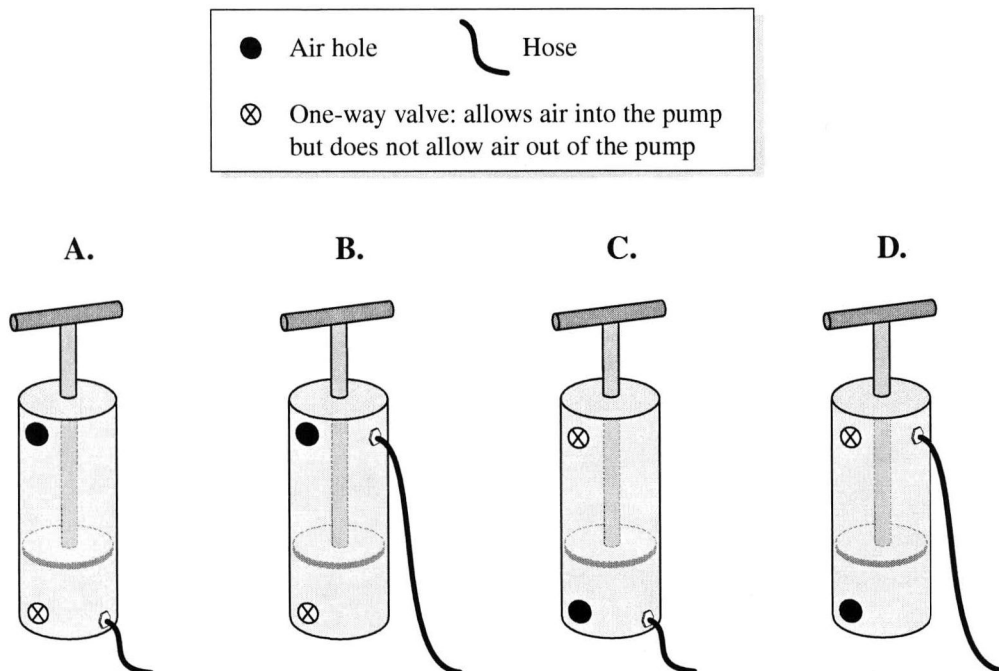
Science

Use the following diagram to answer question 1.

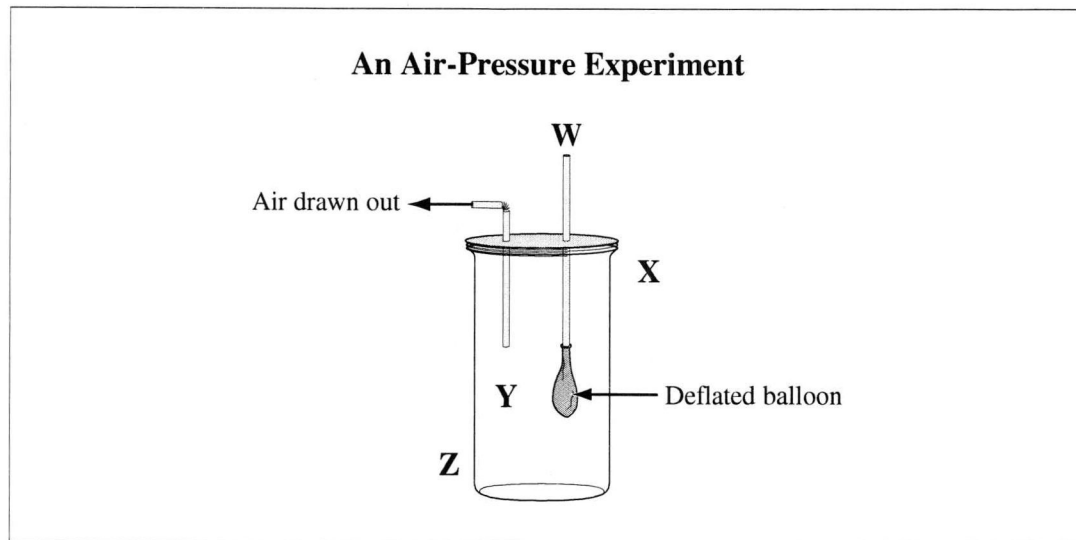


1. The purpose of the hood shown above is to help the truck to
 - A. create lift
 - B. create more drag
 - C. become lighter
 - D. become more streamlined

2. Which of the following diagrams illustrates the **most effective** design for a bicycle pump?



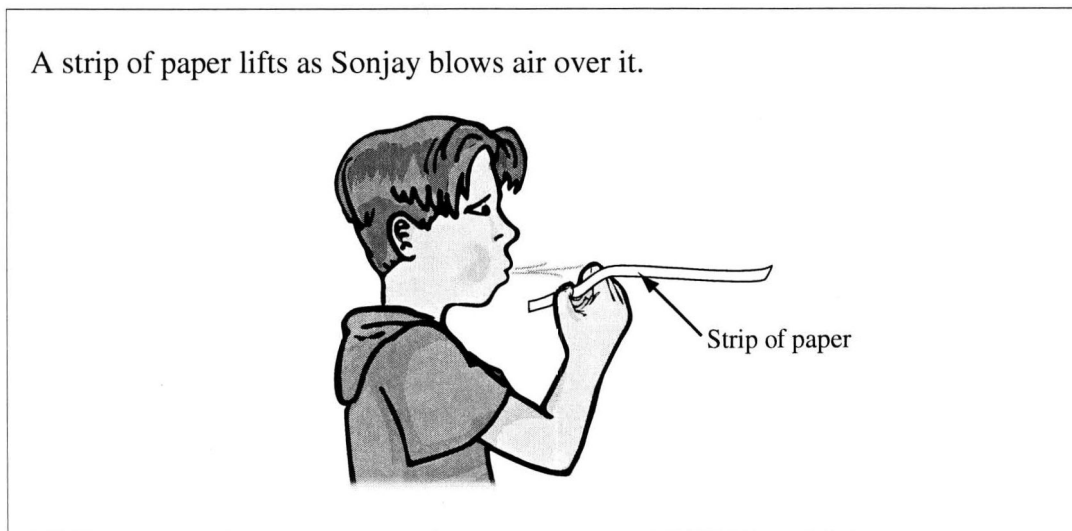
Use the following diagram to answer question 3.



3. If air is drawn out of the jar shown above, the balloon inside the jar will inflate because a low pressure area will be formed at point
- A. W
 - B. X
 - C. Y
 - D. Z
-
4. As Jasmine drinks from a juice box through a straw, the juice moves up the straw because the air pressure is
- A. low inside both the straw and the juice box
 - B. high inside both the straw and the juice box
 - C. lower inside the straw than inside the juice box
 - D. higher inside the straw than inside the juice box
5. The part of a bird that works **most** like the rudder of an airplane is the bird's
- A. curved wings
 - B. hollow bones
 - C. long tail feathers
 - D. strong chest muscles

6. The main reason penguins **cannot** fly is that
- A. their bodies are not streamlined enough to overcome air resistance
 - B. their wings cannot develop enough lift to overcome gravity
 - C. they cannot generate enough speed to overcome gravity
 - D. they cannot tuck in their legs enough to decrease drag
7. During which of the following activities does a bird create a force of lift that is greater than the force of gravity?
- A. Preparing to land
 - B. Taking off
 - C. Gliding
 - D. Resting

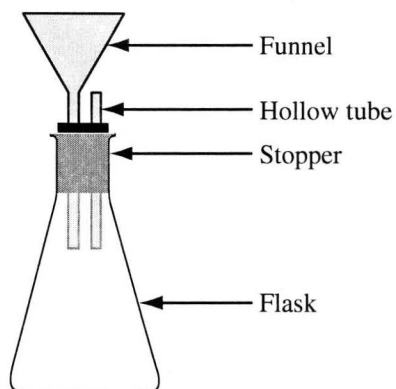
Use the following information to answer question 8.



8. The strip of paper lifts because the fast moving air creates an area of
- A. low pressure under the paper strip
 - B. low pressure on top of the paper strip
 - C. high pressure on the part of the paper strip that is closest to Sonjay's mouth
 - D. high pressure on the part of the paper strip that is farthest from Sonjay's mouth

Use the following information to answer question 9.

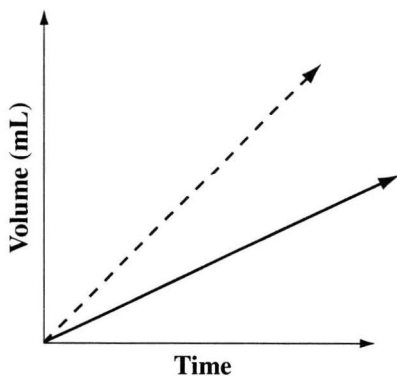
A student sets up a flask as shown below. She continuously fills the flask with water until it is full, while measuring the time that it takes for the flask to fill up.



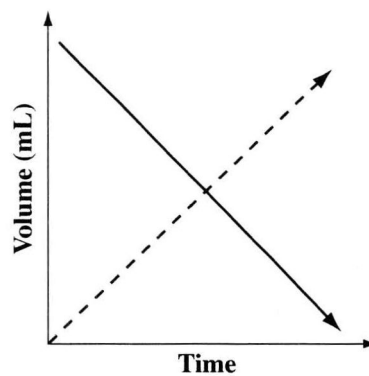
9. Which of the following graphs **best illustrates** the relationship between the volume of air and the volume of water in the flask over the course of the experiment?

Water in flask ————— Air in flask - - - - -

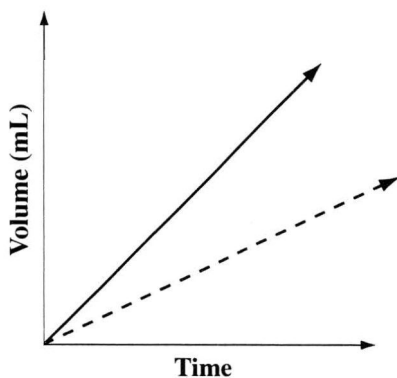
A.



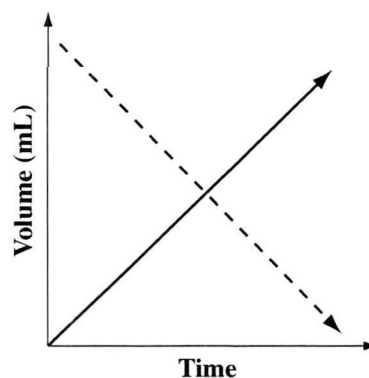
B.



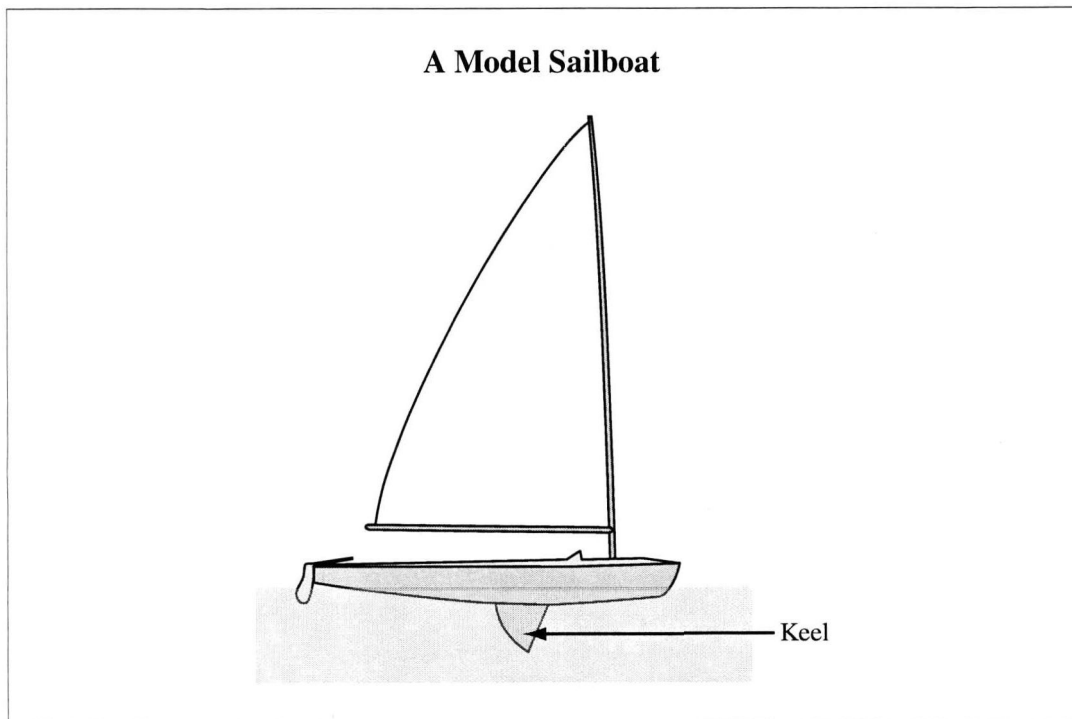
C.



D.



Use the following diagram to answer question 10.



10. The function of a sailboat's keel is **most similar** to the function of an airplane's
- A. left aileron
 - B. right aileron
 - C. vertical stabilizer
 - D. horizontal stabilizer
-
11. Which of the following gases must be present in the atmosphere for a jet engine to burn its fuel?
- A. Helium
 - B. Oxygen
 - C. Carbon dioxide
 - D. Carbon monoxide

Use the following information to answer question 12.

Mae-ling wants to perform an experiment to determine if the length of a parachute's suspension lines affects the time that it takes the parachute to descend to the ground. She identified the four variables listed below.

Variable 1	Length of suspension lines on the parachute
Variable 2	Mass of the object attached to the parachute
Variable 3	Time taken for the parachute to reach the ground
Variable 4	Height above ground from which the parachute was dropped

12. Which of the following variables should she keep constant?

- A. Variables 1 and 2
- B. Variables 1 and 3
- C. Variables 2 and 3
- D. Variables 2 and 4

Use the following information to answer question 13.

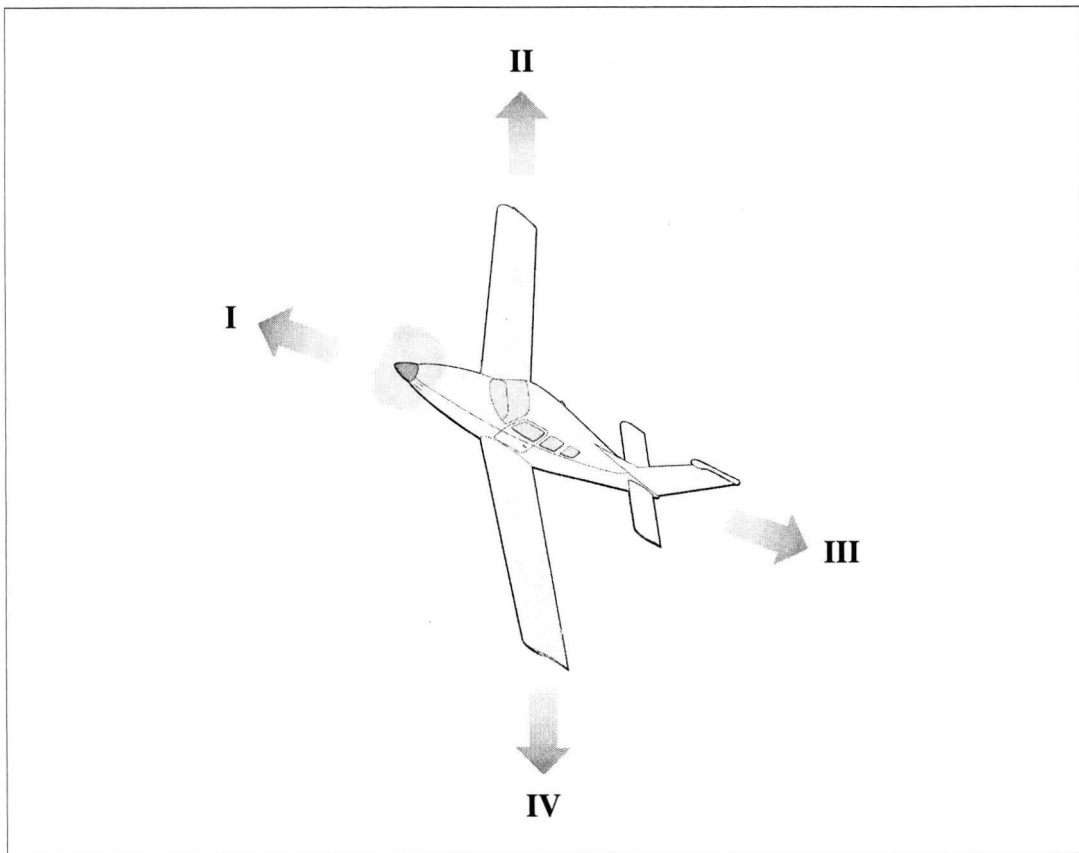
Functions of Four Airplane Components

Row	Elevators	Vertical Stabilizer	Rudder	Ailerons
I	Control bank	Controls pitch	Keeps airplane flying straight	Control yaw
II	Control yaw	Controls bank	Controls pitch	Keep airplane flying straight
III	Control pitch	Keeps airplane flying straight	Controls yaw	Control bank
IV	Keep airplane flying straight	Controls yaw	Controls bank	Control pitch

13. Which row above correctly identifies the functions of four airplane components?

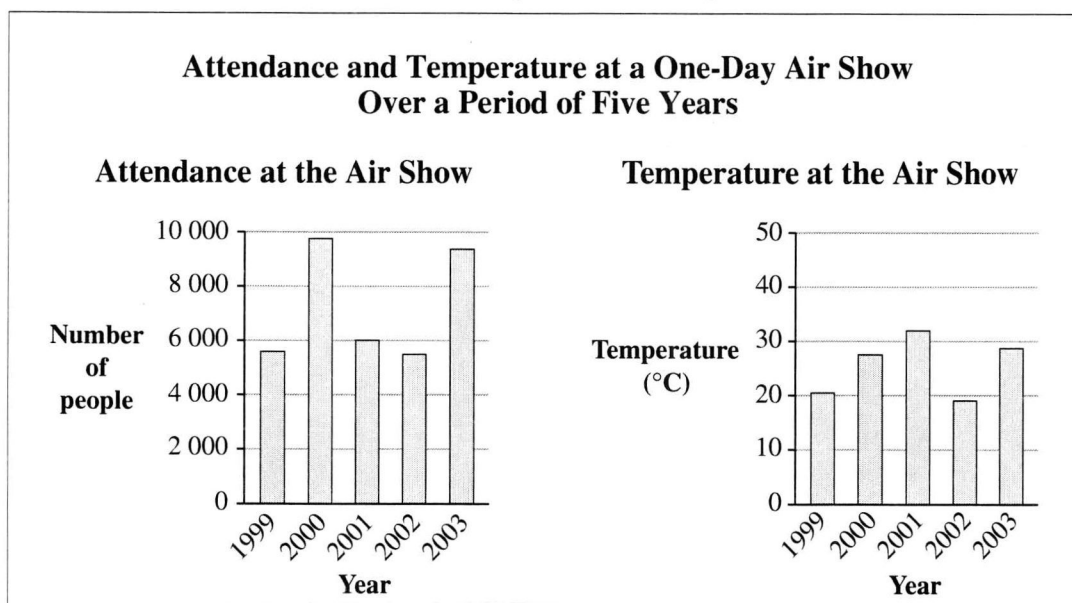
- A. Row I
- B. Row II
- C. Row III
- D. Row IV

Use the following diagram to answer question 14.



14. If the airplane shown above is banking to the left, then, listed in order, the forces that correspond with numbers I, II, III, and IV are
- A. thrust, lift, gravity, and drag
 - B. thrust, lift, drag, and gravity
 - C. lift, thrust, gravity, and drag
 - D. lift, thrust, drag, and gravity
-
15. Which of the following manoeuvres by a pilot would cause an airplane to make a controlled roll to one side?
- A. Positioning both elevators up and both ailerons down
 - B. Positioning both ailerons up and both elevators down
 - C. Positioning one aileron up and the other aileron down
 - D. Positioning one elevator up and the other elevator down

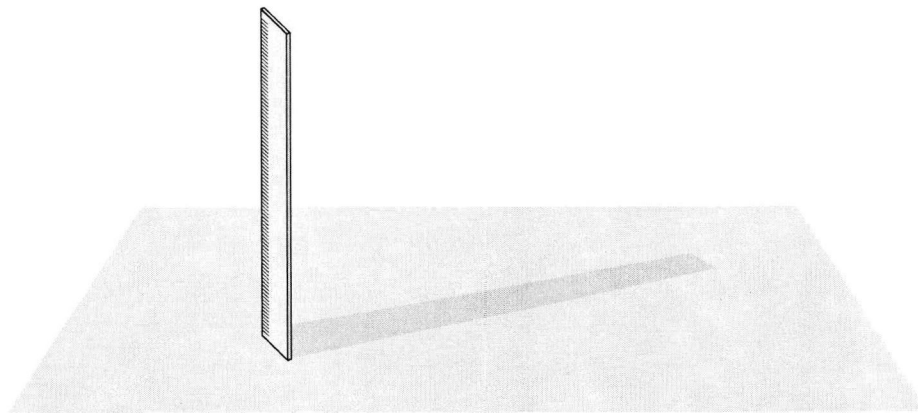
Use the following graphs to answer question 16.



16. Which of the following conclusions is **most strongly** supported by the information in the graphs above?
- A. Attendance increases when the temperature decreases.
 - B. Attendance increases when the temperature increases.
 - C. Attendance is lowest when the temperature is between 25 °C and 30 °C.
 - D. Attendance is highest when the temperature is between 25 °C and 30 °C.
-
17. Which of the following modes of transportation stays in the air because it is less dense than the fluid through which it is moving?
- A. Hot air balloon
 - B. Space shuttle
 - C. Helicopter
 - D. Parachute
18. Which of the following celestial bodies emits light?
- A. Star
 - B. Moon
 - C. Comet
 - D. Planet

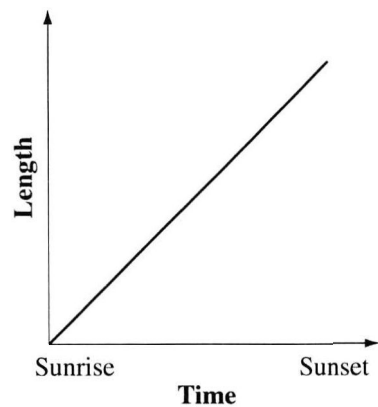
Use the following information to answer question 19.

A student records the length of the shadow cast by a ruler between sunrise and sunset.

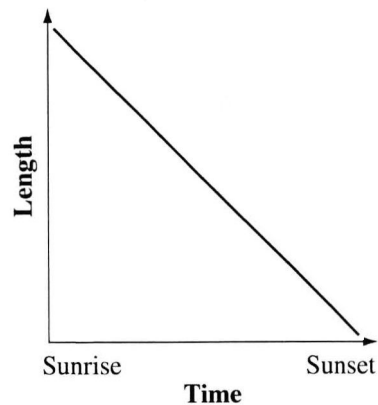


19. Which of the following graphs **best** illustrates the length of the shadow cast by the ruler between sunrise and sunset?

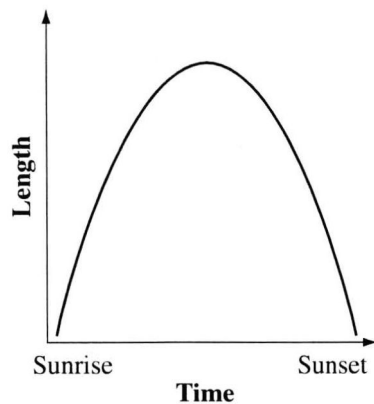
A.



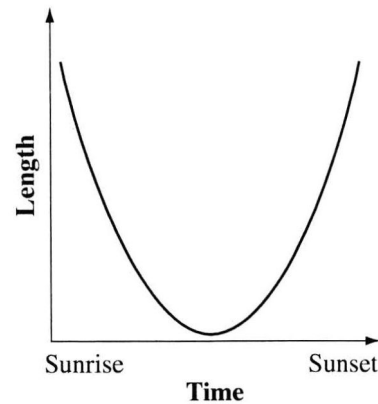
B.



C.

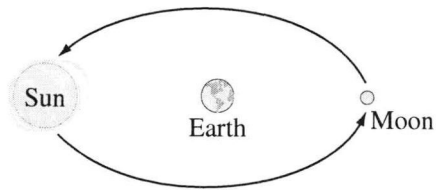


D.

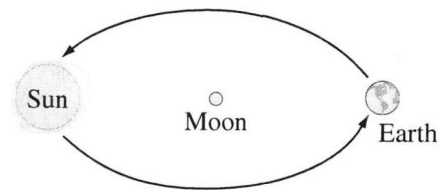


20. Which of the following models shows the correct movement of Earth, the moon, and the sun?

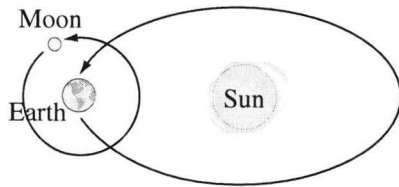
A.



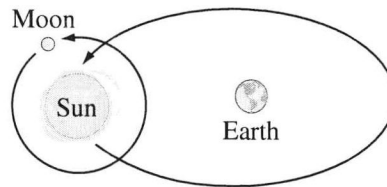
B.



C.

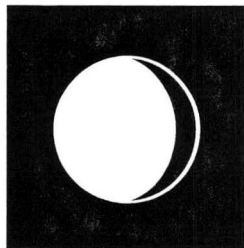


D.

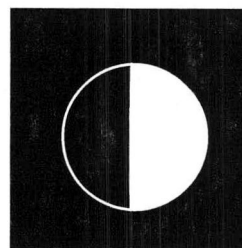


21. Which of the following diagrams represents the phase of the moon approximately seven days after a new moon?

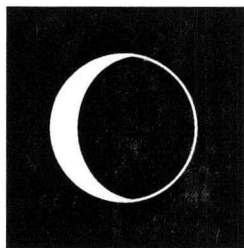
A.



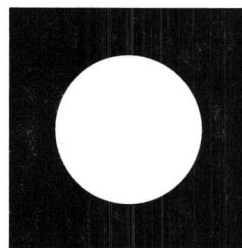
B.



C.

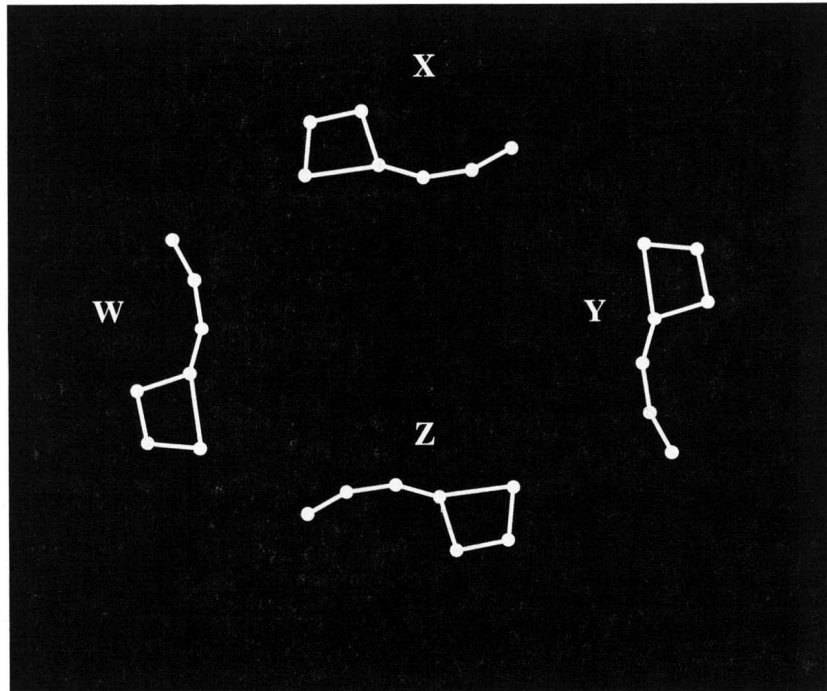


D.



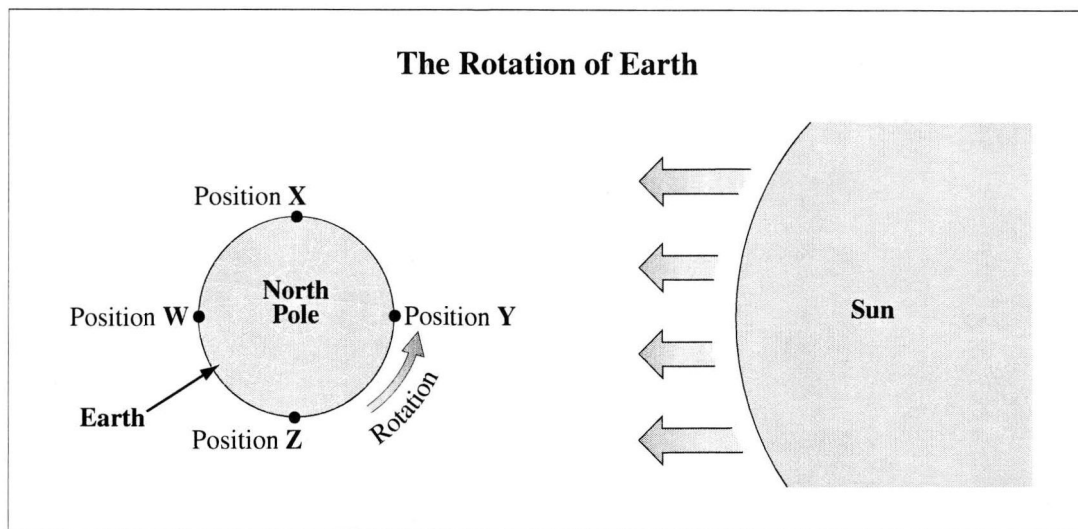
Use the following diagram to answer question 22.

**Positions of the Big Dipper as It Is Viewed from a Specific Location
over the Course of a Year**



22. If the position marked W on the diagram above represents the Big Dipper in June, then the position marked Y represents the Big Dipper in
- A. March
 - B. May
 - C. September
 - D. December
-
23. In which of the following lists are parts of space ordered from smallest to largest?
- A. Solar system, galaxy, universe
 - B. Galaxy, universe, solar system
 - C. Milky Way, solar system, universe
 - D. Universe, Milky Way, solar system

Use the following diagram to answer questions 24 and 25.



24. The location on the diagram that is experiencing sunset is labelled position
- A. W
 - B. X
 - C. Y
 - D. Z
25. The time that it takes Earth to rotate three-quarters of a turn on its axis is
- A. 18 hours
 - B. 12 hours
 - C. 8 hours
 - D. 6 hours

Use the following chart to answer questions 26 and 27.

Some Characteristics of the Planets in Our Solar System									
	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Mean distance from sun (AU)	0.39	0.72	1.00	1.52	5.20	9.54	19.19	30.06	39.48
Length of year (Earth time)	87.97 days	224.7 days	365.24 days	686.93 days	11.86 years	29.4 years	84.02 years	164.79 years	247.92 years
Diameter (km)	4 879	12 104	12 756	6 794	142 984	120 536	51 118	49 528	2 390
Composition	solid	solid	solid	solid	gas	gas	gas	gas	solid
Known natural satellites (as of 2006)	0	0	1	2	63	46	27	13	1
Length of day (Earth time)	58.50 days	243.00 days	23.93 hours	1.03 days	9.93 hours	10.66 hours	17.24 hours	16.11 hours	6.39 days

26. Venus is sometimes called Earth's twin. The information in the chart that best supports this description is that both planets
- A. have approximately the same diameter
 - B. have approximately the same length of day
 - C. are approximately the same distance from the sun
 - D. take approximately the same time to revolve around the sun
27. An observation that can be made about the four largest planets compared with the other planets is that they
- A. are colder
 - B. are more dense
 - C. experience more daylight
 - D. have more natural satellites

28. Which of the following crimes is **most likely** to be solved using handwriting analysis?
- A. Forgery
 - B. Art theft
 - C. Vandalism
 - D. Shoplifting

Use the following information to answer question 29.

A Grade 6 student conducts a paper chromatography test. She uses one pen to draw a line on a strip of paper, then dips that paper into a beaker of water. She repeats this process for another three pens. The results of her test are shown below.

Pen	Colour Components of Ink
1	Red, brown
2	Blue, grey
3	Orange, brown
4	Blue, red

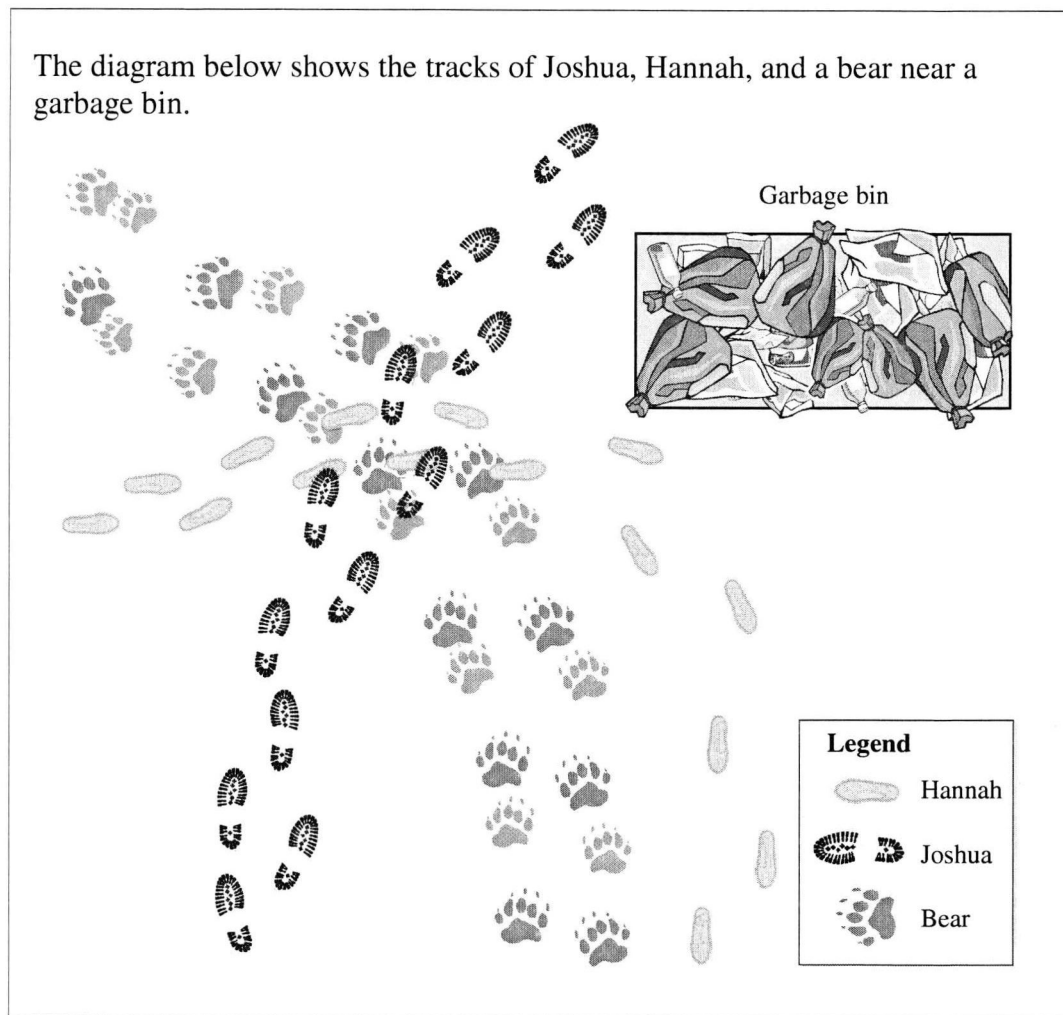
29. The manipulated (independent) variable in this test is the
- A. colour of ink components
 - B. ink from four pens
 - C. beaker of water
 - D. strip of paper

Use the following table to answer questions 30 and 31.

Characteristics of Four Different Pens			
Pen	Thickness of Pen Tip	Whether Ink Bleeds	Colour Separation in Ink
I	Fine	Yes	Black and blue
II	Fine	No	Black
III	Thick	Yes	Black, blue, and red
IV	Thick	No	Black

30. A handwritten note is found in a puddle. It can be read easily, and the writing is composed of crisp, narrow lines. Which of the pens from the table above was **most likely** used to write the note?
- A. I
B. II
C. III
D. IV
31. Which of the pens is **best** suited to labelling wooden boxes that are going to be stored in a moist environment?
- A. I
B. II
C. III
D. IV

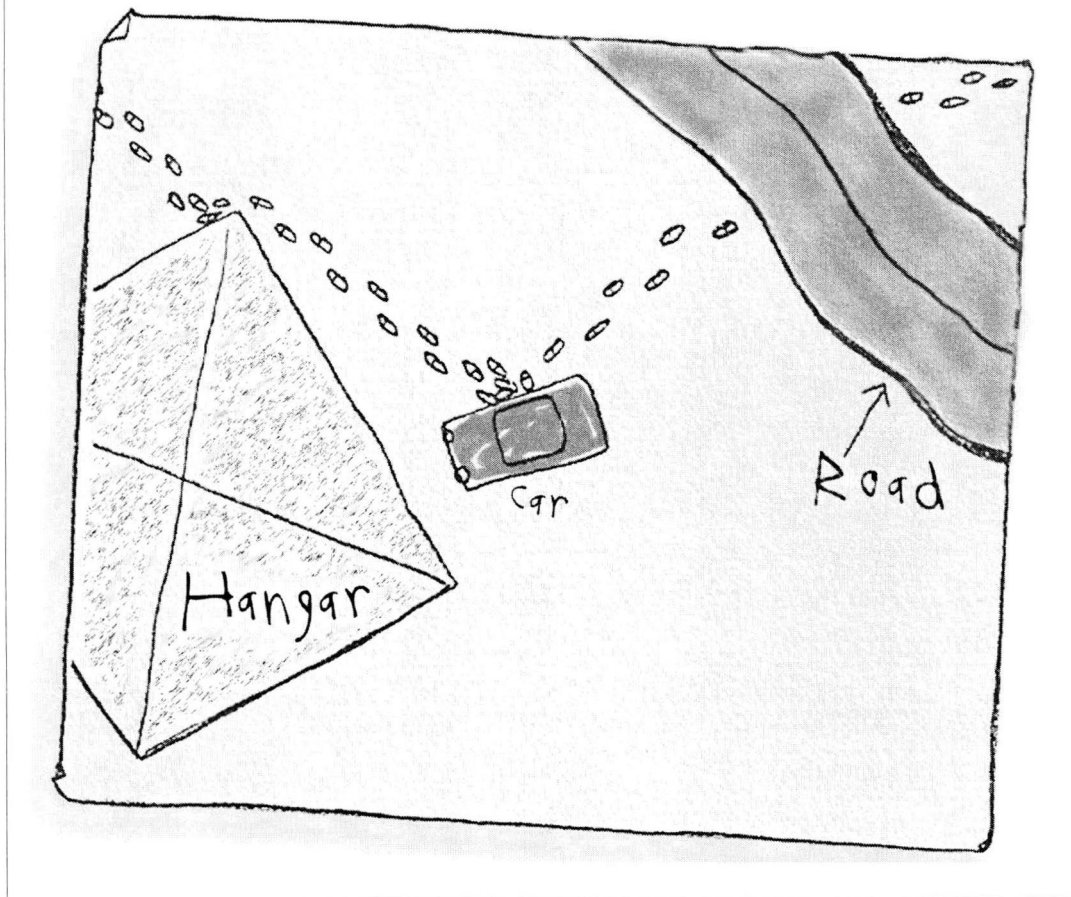
Use the following information to answer questions 32 and 33.



32. If Hannah approached the garbage bin from the west, then she left the scene heading
- A. east
 - B. west
 - C. north
 - D. south
33. Which of the following inferences can be drawn by examining the tracks?
- A. Hannah walked near the garbage bin after the bear did.
 - B. Joshua walked near the garbage bin before Hannah did.
 - C. Joshua walked near the garbage bin and ran after the bear.
 - D. Hannah walked near the garbage bin and then walked in the same direction as the bear.

Use the following information to answer question 34.

A detective sketched a map of a particular crime scene.



34. The best inference that can be made from the map is that the
- A. footprints were made by two different people
 - B. surface of the road was too hard to allow footprints to form
 - C. person jumped from one side of the road to the other side
 - D. footprints on the two sides of the road were made at two different times

Use the following information to answer question 35.

A teacher conducted an experiment to determine the characteristics of different fabrics. All the fabric samples had an area of 5 cm².

Characteristics of Fabrics

Fabric Sample	Stretch of Fabric (cm²)	Colourfastness	Flammability	Absorbency of a 5 mL Water Sample	Weave
1	1	No	Melts	0.5 mL of water is absorbed	Tight
2	2	No	Burns to a residue	0.5 mL of water is absorbed	Loose
3	3	No	Melts	1.0 mL of water is absorbed	Tight
4	3	Yes	Burns to a residue	4.5 mL of water is absorbed	Loose

35. Which fabric sample was not colourfast, not highly water absorbent, and had a loose weave?

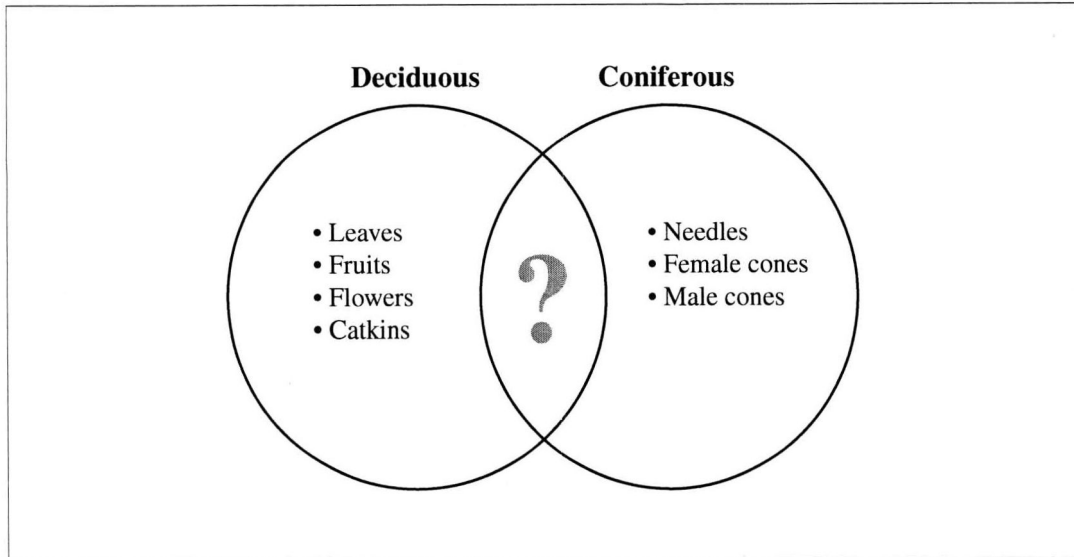
- A. 1
 - B. 2
 - C. 3
 - D. 4
-

36. THIS ITEM IS STILL SECURED AND WILL NOT BE RELEASED

37. Which of the following organisms do **not** feed on other organisms in an ecosystem?

- A. Decomposers
- B. Omnivores
- C. Carnivores
- D. Producers

Use the following Venn diagram to answer question 38.



38. Which of the following groups lists characteristics that are common to both deciduous and coniferous trees?

A.

- Trunk
- Bark
- Seeds

B.

- Root system
- Nuts
- Bark

C.

- Bark
- Seeds
- Crown shape

D.

- Bark
- Crown shape
- Nuts

39. Which of the following species of tree can provide the **best** shade all year long?

- A. Elm
- B. Birch
- C. Poplar
- D. Spruce

40. Cutting down large areas of forested land can lead to more

- A. carbon dioxide in the air
- B. water vapour in the air
- C. nitrogen in the air
- D. oxygen in the air

Use the following table to answer question 41.

Characteristics of Four Seedlings		
Kind of Seedling	Number of Leaves	Height of Seedling (cm)
Balsam poplar	6	15
White birch	4	5
Willow	2	4
Aspen poplar	4	10

41. Which of the following statements can be made from the information in the table?

- A. The aspen poplar seedling is twice as tall as the willow seedling.
- B. The aspen poplar seedling has more leaves than the white birch seedling.
- C. The balsam poplar seedling has more leaves than the willow seedling.
- D. The balsam poplar seedling has twice as many leaves as the white birch seedling.

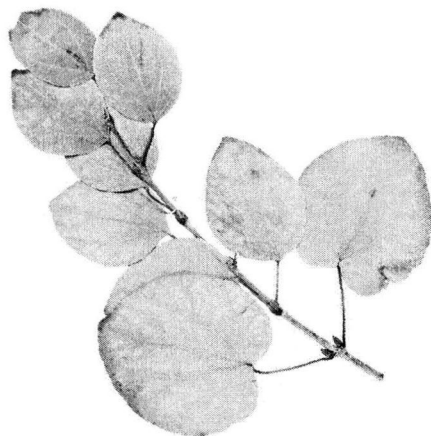
Use the following information to answer question 42.

Characteristics of Leaves on a Branch

Classification of leaf:	simple
Shape of leaf:	ovate
Pattern on the edge of the leaf:	coarse-toothed
Arrangement of leaves on branch:	alternate

42. Which of the following pictures **best** represents the leaf characteristics described above?

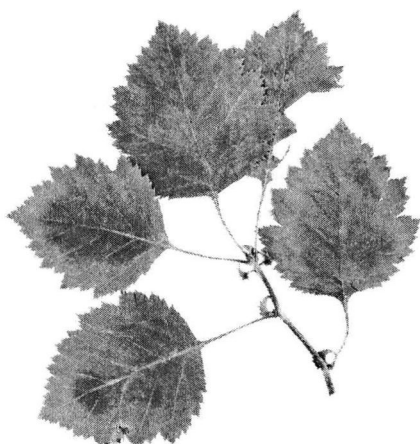
A.



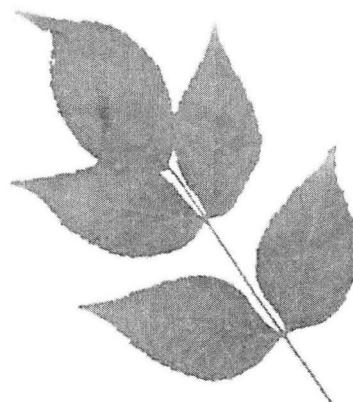
B.



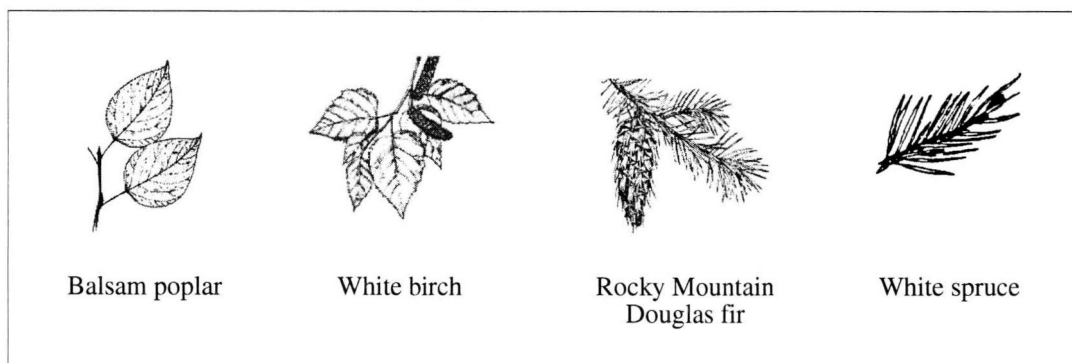
C.



D.



Use the following information to answer question 43.



43. In which of the following tables are the four trees correctly classified?

A.

Types of Trees

Deciduous	Coniferous
White birch	Balsam poplar
White spruce	Rocky Mountain Douglas fir

B.

Types of Trees

Deciduous	Coniferous
White birch	Balsam poplar
Rocky Mountain Douglas fir	White spruce

C.

Types of Trees

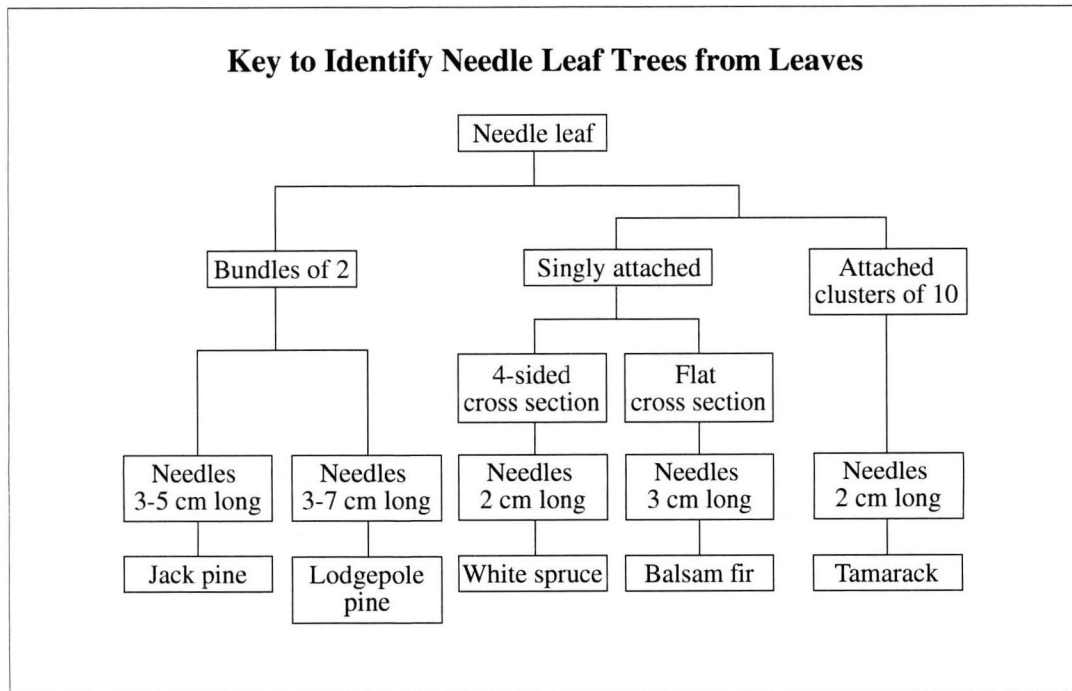
Deciduous	Coniferous
Rocky Mountain Douglas fir	Balsam poplar
White spruce	White birch

D.

Types of Trees

Deciduous	Coniferous
Balsam poplar	Rocky Mountain Douglas fir
White birch	White spruce

Use the following information to answer question 44.



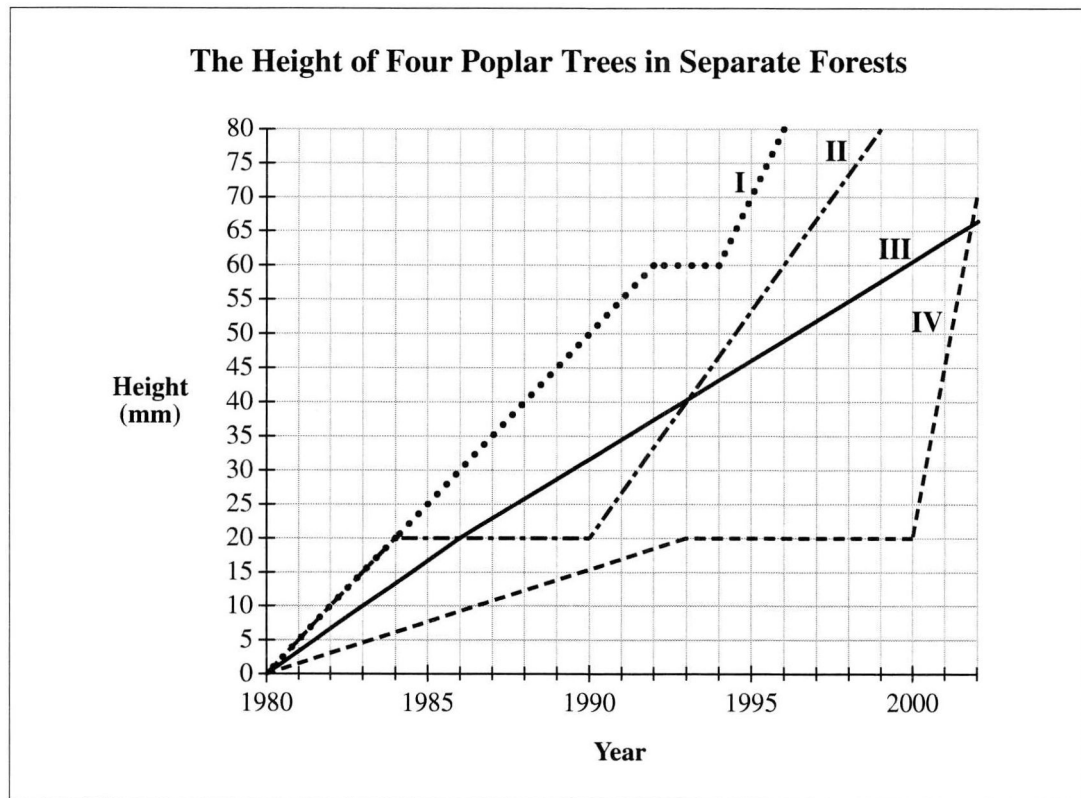
44. According to the key above, which tree has needles that are short, square, and singly attached to their own twig?

A. Jack pine
B. Tamarack
C. Balsam fir
D. White spruce

45. In the nutrient cycle, the role of decomposers is to

A. take minerals from the soil
B. feed on other living organisms
C. break down dead plant and animal material
D. use energy from the sun to make their own food

Use the following graph to answer questions 46 and 47.



46. Which two trees were the same height in 1993?
- A. I and II
 - B. I and III
 - C. II and III
 - D. II and IV
47. Which tree grew the most between 1990 and 1993?
- A. I
 - B. II
 - C. III
 - D. IV

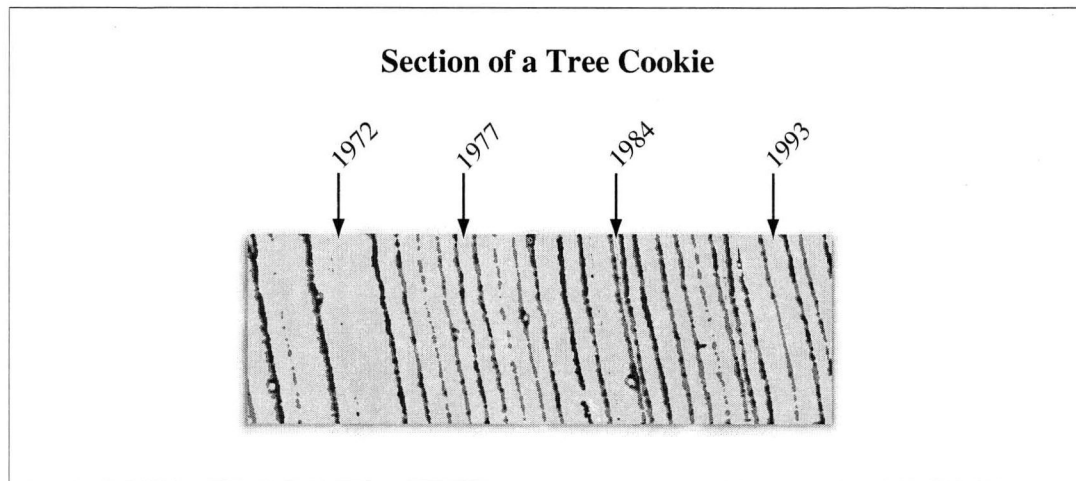
Use the following information to answer questions 48 and 49.

Some foresters wanted to find out if altitude affects how tall a tree grows. They planted one poplar tree at each of seven different elevations in a controlled experiment. After two years, they measured how much the trees had grown. The results are shown in the following table.

The Growth of Poplar Seedlings at Varying Elevations		
Poplar Tree	Elevation Above Sea Level (m)	Height of Tree (cm)
1	2 000	4
2	1 800	7
3	1 600	10
4	1 400	13
5	1 200	16
6	1 000	?
7	?	?

48. From the information above, one can infer that, after two years, the height of a poplar tree growing at an elevation of 800 m will be
- A. 19 cm
 - B. 20 cm
 - C. 22 cm
 - D. 23 cm
49. A prediction that can be made from the table above is that
- A. poplar tree 2 will have wider rings than poplar tree 6
 - B. poplar tree 4 will have wider rings than poplar tree 3
 - C. poplar tree 5 will have the narrowest rings
 - D. poplar tree 1 will have the widest rings

Use the following diagram to answer question 50.



50. In which of the following years did the tree grow the least?
- A. 1972
 - B. 1977
 - C. 1984
 - D. 1993